EFFECTIVE METHOD OF ACHIEVING PALLIATIVE RELIEF OF COUGH, 202 patients with metastatic disease located in the bronchus. It can be, two, three and four months respectively. Of the 22 patients documented in 75.0 % (21/28), hemoptysis in 76.4% (13/18), of symptoms at baseline, improvement in cough was absent to moderate (2), significant (3), and severe (4) at the time of initial consult and in follow up. The duration of symptom improvement and re-expansion of the lung documented on imaging were analyzed using Kaplan-Meier curves. Results: Thirty-five patients with endobronchial metastasis were identified (14 GIT, five breast, three each of sarcoma, lymphoma, melanoma, renal cell, two head and neck, one cervix and one testicle). The majority of patients received three fractions of 700 cGy, and 15 patients had received EBRT to the lung beforehand and four afterwards. Median symptom-free survival was 67 days and overall survival was 117 days. Of patients reporting the presence of symptoms at baseline, improvement in cough was documented in 75.0 % (21/28), hemoptysis in 76.4% (13/18), pain in 64.3% (9/14) and dyspnea in 60.0% (18/30) for a median of three, three and six months respectively. Absent to mild cough (n = 17), pain (n = 21), and dyspnea (n = 6) scores were maintained for median periods of two, three and four months respectively. Of the 22 patients who had subsequent chest imaging, re-expansion was documented in 32%. There were no significant toxicities reported.

Conclusions: Brachytherapy appears effective in achieving durable symptom control of cough hemoptysis and dyspnea in patients with metastatic disease located in the bronchus. It can be used in combination with or as an alternative to external beam radiotherapy, and should be considered routinely where available in this patient population. Further studies are required to better characterize expected symptom improvement and lung re-expansion rates.

203 HIGH-DOSE RATE BRACHYTHERAPY FOR THE MANAGEMENT OF MALIGNANT ENDOBRONCHIAL OBSTRUCTION AND HEMOPTYSIS: INSTITUTIONAL CASE SERIES OF 28 PATIENTS Martin Korzeniowski1, Christine D’Arsigny1, Onofre Moran-Mendoza1, Mary Westerdale1, Conrad Falkson1 1Queen’s University, Kingston, ON 2Cancer Centre of Southeastern Ontario, Kingston, ON

Purpose: Endobronchial complications of primary and metastatic lung malignancy contribute to considerable patient morbidity and adversely affect quality-of-life with symptoms of dyspnea and hemoptysis. Endobronchial High-Dose Rate (HDR) Brachytherapy is an efficacious treatment strategy indicated for large obstructing endobronchial lesions not amenable to surgical resection, combination treatment with external beam radiotherapy for potentially improved local control and for the palliation of symptoms in the re-treatment setting. The purpose of this study was to explore the clinical features and outcomes in a consecutive series of patients treated for malignant endobronchial obstruction at a single institution.

Methods and Materials: A retrospective analysis was performed on all patients consecutively treated at the Cancer Centre of Southeastern Ontario with endobronchial HDR Brachytherapy between November 2012 and March 2015. The demographic and clinical characteristics were collected and overall survival and symptomatic progression-free survival are reported.

Results: Twenty-eight consecutively treated patients (17 male and 11 female) were identified for review. The average age at the time of treatment was 69.12 years. The majority of patients had a histopathological diagnosis of lung cancer (n = 21 non-small cell lung cancer, n = 1 small cell lung cancer) while the remainder (n = 6) had metastatic disease from other primaries. Fifteen patients had metastatic disease at presentation and nine were treated with systemic therapy prior to brachytherapy. The major indication for treatment included dyspnea (n = 18) and hemoptysis (n = 10) with 12 patients identified to have complete bronchial occlusion by bronchoscopy. Two patients were treated in a critical care setting and discharged home with stabilization of symptoms. The median overall survival for the group was 17.58 weeks while the median symptomatic progression-free survival was 9.82 weeks.

Conclusions: Endobronchial HDR brachytherapy remains an efficacious treatment strategy for patients presenting with malignant bronchial occlusion causing dyspnea and/or hemoptysis. Our experience demonstrates that carefully-selected patients can experience effective palliation of symptoms despite an overall poor prognosis for the group. While limited, our experience also demonstrates that some patients with massive-hemoptysis or respiratory failure may benefit from treatment in the hands of a skilled brachytherapy team.

204 DO RECTAL TUBES IMPROVE DOSIMETRY IN INTERSTITIAL BRACHYTHERAPY FOR GYNECOLOGICAL MALIGNANCIES? Pencilla Lang1, Ananth Ravi2, Matt Wronski2, Lucas Castro Mendez2, Eric Leung2 1University of Toronto, Toronto, ON 2Sunnybrook Health Sciences Centre, Toronto, ON

Purpose: The dosimetry of trans-perineal interstitial brachytherapy (ISBT) treatment of gynecological malignancies can be significantly affected by the presence of rectal gas. This study evaluates the impact of using a rectal tube on dosimetric factors.

Methods and Materials: Twenty-nine patients treated between August and December 2015 at our institution were included in a prospective registry trial. Data on the use of a rectal tube and dosimetric parameters were collected. Rectal volume, maximum dose to 2 cc of the rectum contour (D2cc) and the minimum dose to 90% of the high-risk clinical target volume (HR-CTV D90) was compared using a t-test for the rectal tube and no rectal tube cohorts. The rectal volume was measured from 1cm above and
below the superior and inferior extents of the target volume. For patients that received planning CT scans both immediately before and after rectal tube insertion, treatment plans were generated retrospectively with matched rectal D2cc. The resulting plans were compared visually, and the dose received by the HR-CTV D90 was compared.

Results: All patients were treated with a combination of external beam radiotherapy to the pelvis and 3-5 fractions of high-dose rate interstitial brachytherapy in twice daily fractions. Ten and 19 patients were treated without and with a rectal tube respectively. Rectal volume between the first and third fractions was significantly more reproducible in the rectal tube group (p = 0.038). There was a significant increase in the HRCTV D90 with the use of a rectal tube (mean HRCTV D90 99.5% in the non-rectal tube group and 90% in the rectal tube group, p = 0.001). The rectal volume was no significant difference in the D2cc rectum between the two groups (p = 0.77). Seven patients received a planning CT immediately prior to and immediately after rectal tube insertion, and plans with matched rectal doses were generated (11 pairs of plans). For these patients there was no significant difference in the HRCTV D90 between the rectal tube and no rectal tube plans (p = 0.187). There were seven plans in which the use of a rectal tube increased the HRCTV D90, and four plans in which it lowered the HRCTV D90. On visual inspection of these plans the rectal tube appeared to push the rectal wall anteriorly.

Conclusions: For the patients included in this study, the use of a rectal tube in IBT significantly reduced variability in rectal volume between the first and third treatment fractions. Overall the use of a rectal tube was associated with a significantly increased dose to the HRCTV D90, and no significant change in the D2cc to the rectum. However, for some patients the use of a rectal tube may worsen dosimetric parameters if the rectum is pushed anteriorly towards the target volume by the relatively stiff rectal tube. Further work is required in identifying patients who may not benefit from use of a rectal tube.

205 CERVICAL CANCER BRACHYTHERAPY IN CANADA: A FOCUS ON INTERSTITIAL BRACHYTHERAPY UTILIZATION
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Purpose: Brachytherapy (BT) techniques for cervical cancer (CC) in Canada have changed over the last decade, with evolution to HDR and image-guided BT. However, there are currently no national data on the use of interstitial BT (IBT) in the management of patients with CC. The purpose of this study was to document IBT utilization in Canadian centres, as well as update details of CC BT practices.

Methods and Materials: All Canadian centres with gynecologic BT services (n = 32) were identified, and one gynecologic radiation oncologist per centre was sent a 33-item e-mail questionnaire regarding the centre’s practice for CC BT in 2015. Responses are reported and compared with practice patterns identified in a 2012 Canadian survey.

Results: The response rate was 81% (26 of 32 centres). The majority (92%) used high-dose rate (HDR) BT, identical to the 2012 survey. More than three percent (12 of 32) of centres had transitioned to 3D MRI/CT based planning by 2015, versus 80% in 2012. Ninety-three percent (24 of 26) of centres had a majority (92%) used high-dose rate (HDR) BT, identical to the update details of CC BT practices.

Conclusion: In Canada, treatment of cervical cancer continues to evolve. Interstitial BT has been adopted by half of the responding centres. As more centres move to MRI-based image-guided treatment planning, IBT will become an even more integral part of cervical cancer treatment.

206 EXTERNAL VALIDATION OF THE PROCARS NOMOGRAMS FOR LOCALIZED PROSTATE CANCER
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Purpose: Risk stratification for localized prostate cancer can assist clinicians select the most appropriate treatment for their patients based on baseline clinical factors. The present study aimed to externally validate a recently published nomogram for low-dose rate (LDR) brachytherapy that was developed in patients treated in several Canadian centers.

Methods and Materials: Patients receiving LDR brachytherapy at the Centre Hospitalier de l’Université de Montréal (CHUM) for localized prostate cancer between 2005 and 2015 and with a minimum of six months of follow up were eligible for analysis (n = 903). External validation was performed on the ProCaRS nomogram for LDR-brachytherapy to predict five-year biochemical failure free survival (BFFS). This was performed using calibration plots of nomogram predicted probability compared to corresponding Kaplan-Meier five-year BFFS estimates.

Results: Mean age of the validation cohort was 65 years and median baseline PSA was 5.5 ng/mL. All patients had T1 (75%) or T2 (25%) disease and most had either Gleason 6 (70%) or Gleason 7 (25%). Mean D90 was 161 Gy (standard deviation [SD] 25) and 10% of patients received D90 < 130 Gy. Reasonable nomogram calibration was observed (R2 = 0.778), however this produced an underestimation of the true survival for all values based on the point estimates, particularly for nomogram predicted survival < 90% and 92-94%. This finding may be partially attributed to the limited number of patients with observed BFFS < 90% and a shorter follow up in the CHUM compared to the original cohort used to develop the nomogram. A sensitivity analysis was performed to determine an adjustment to the nomogram predicted probability to improve calibration. Applying an adjustment of +3.24% to the nomogram predicted probability yielded a more favourable calibration for both nomograms (adjusted R2 = 0.813).

Conclusions: We believe the LDR brachytherapy ProCaRS nomogram is a clinically useful tool that may help clinicians in treatment selection and outcome prediction for prostate cancer. For instance, it may be useful in counseling patients with intermediate-risk cancers that may benefit from exclusive LDR brachytherapy.